

REMARKS

Claims 1-20 stand rejected. Claim 15 has been cancelled without prejudice. Claim 1 has been amended to set forth the subject matter of the invention more clearly. Claim 16 has been amended to recite proper dependency in view of cancelled claim 15 from which it originally depended. Reconsideration of the application as amended is respectfully requested.

Rejections Under 35 U.S.C. § 102

The Examiner rejected claims 1, 3, 4, 7, 13, 14 and 17-19 under 35 U.S.C. § 102(b) as being anticipated by Baerg et al. (US 4,980,019). With specific regard to independent claim 1, the Examiner stated:

Baerg et al. disclose an integrated circuit encapsulation apparatus (col. 3, line 6 to col. 7, line 43 and fig. 5) comprising:

- A first support plate 37;
- A second support plate 45 proximately positioned with respect to the first support plate;
- A cavity plate 43 positioned between the first support plate and the second support plate, where the cavity plate having an aperture 44 configured to accept a protruding portion of the circuit package (fig. 5) such that the protruding portion of the circuit package contacts the first support plate 37.

Applicant respectfully traverses this rejection. Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every element or step of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569

(Fed. Cir. 1984). Thus, if the claims recite even one element not found in the cited reference, the reference does not anticipate the claimed invention.

The present application is directed to a system for molding a circuit package. More specifically, the present system facilitates the molding of a circuit package and produces a molded circuit package having an exposed die face. One of the disadvantages of prior conventional systems is that they increase package height by encapsulating the entire package (page 2, lines 19-21). The presently claimed system adds no additional height to the top of the circuit package during the encapsulation process since the top surface of the die portion of the circuit package is only encapsulated about its periphery, leaving the surface of the die exposed (page 4, lines 11-12). To facilitate the encapsulation of the periphery of the die while maintaining exposure of the top surface of the die, the cavity plate is configured to provide an aperture to receive the die portion of the circuit package such that the die surface is brought into contact with the first support plate, either directly or indirectly through a film. Not only does the present system alleviate the disadvantages associated with adding additional height to the circuit package during the encapsulation process, but by leaving the face of the die exposed, the present system provides a circuit package that advantageously dissipates heat rapidly (page 4, lines 11-13).

Accordingly, claim 1 recites a system for molding a circuit package comprising a first support plate, a second support plate, and a cavity plate. The cavity plate is positioned “between the first support plate and the second support plate.” Further, the cavity plate has “an aperture configured to accept *only* a protruding portion of the circuit package such that the protruding

portion of the circuit package contacts the first support plate." Still further, "the aperture is sized to create a peripheral void about only the protruding portion of the circuit package to permit a molding compound to be disposed thereabout."

Conversely, the Baerg et al. is directed to an apparatus and method used in the failure analysis of integrated circuits. Col. 1, lines 9-10. Accordingly, the Baerg reference discloses an apparatus and a method to be used in conjunction with an etcher to remove dielectric layers from an integrated circuit. Col. 3, lines 7-10. To implement the removal of dielectric layers from a failed integrated circuit package 9, a plate 43 having an opening 44 is placed on top of a cathode electrode 37. Col. 5, lines 62-63. The opening 44 is of appropriate size and shape to adequately contain the entire package 9. Col. 5, lines 63-65. The plate 43 rests on top of the cathode 37 and the package 9 maintains contact with the cathode 37 by residing within the opening 44. Col. 5, lines 65-67. Next a cap 45 is disposed onto the cathode 37 to provide a cover for the package 9. Col. 6, lines 9-10. The cap 45 is of sufficient size and shape to encompass the package 9 and to fit within the opening 44. Col. 6, lines 10-12. The geometries of the cap 45 *must enclose the package 9 and reside within the opening 44*. Col. 6, lines 16-19. Accordingly, the opening 44 is *to be of sufficient size and shape to permit both the package 9 and cap 45 to reside within the opening 44*.

The Examiner has characterized the cathode 37 as the first support plate, the cap 45 as the second support plate, and the plate 43 as the cavity plate recited in the present claims. However, it is clear that the plate 43 cannot possibly correlate with the cavity plate recited in the present claims for at least three reasons. First, the cavity plate recited in the present claims is "positioned

between the first support plate and the second support plate.” Conversely, while the plate 43 disclosed in the Baerg reference is disposed on top of the cathode 37, it can hardly be characterized as being positioned *between* the cap 45 and the cathode 37. To the contrary, the Baerg reference clearly discloses that the cap 45 is sized to fit within the opening 44 of the plate 43, as described above. Because the cap 45 is required to fit within the opening 44 of the plate 43, the plate 43 cannot be positioned *between* the cap 45 and the cathode 37.

Second, the cavity plate recited in the present claims has “an aperture configured to accept only a protruding portion of the circuit package.” That is to say that the present claims recite an aperture in the cavity plate, wherein the aperture is sized to receive something less than the entire circuit package, i.e. only a protruding portion of the circuit package. When read in light of the present specification, it is clear that the protruding portion of the circuit package comprises an integrated circuit die or semiconductor chip protruding from the surface of a substrate but does not include the substrate. Conversely, Baerg discloses a plate 43 having an opening 44 of appropriate size and shape to adequately contain the entire integrated circuit package 9, as discussed above. Further, the opening 44 is to be of sufficient size and shape to permit both the package 9 and cap 45 to reside within the opening 44. Because the opening 44 is configured to receive the entire package 9, the opening 44 of the support plate 43 cannot possibly be configured to receive only a protruding portion of the circuit package, as recited by the present claims.

Third, the aperture recited in the present claims “is sized to create a peripheral void about only the protruding portion of the circuit package to permit a molding compound to be disposed

thereabout." It is clear then that the presently recited invention is used in conjunction with a die molding system to permit a molding compound to be disposed about a die. Conversely, the Baerg reference discloses a system that is used in conjunction with an etcher to remove dielectric layers from an integrated circuit. In a preferred embodiment, the system is implemented in conjunction with a reactive ion etching (RIE) system. Col. 4, lines 60-63. This completely disparate field of art in no way discloses anything to do with disposing a molding compound. Accordingly, the opening 44 in the cavity plate 43 can hardly be said to be sized to permit a molding compound to be disposed about the protruding portion of the package 9, as recited in the present claims.

For at least these reasons, Applicant respectfully submits that claim 1 recites elements not found in the cited reference. Therefore, the claims cannot be anticipated by the cited reference. Accordingly, Applicant requests withdrawal of the Examiner's rejection and allowance of claims 1, 3, 4, 7, 13, 14 and 17-19.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 2, 8-12, 15, 16 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Baerg et al. in view of Neu (US 5,405,255). Claim 15 has been cancelled without prejudice for possible filing in a continuing application. Each of the rejected claims is dependent on claim 1. The Examiner's rejections are too lengthy to be efficiently reproduced in their entirety herein. However, Applicant respectfully traverses this rejection.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination or modification includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Further, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

The Neu reference discloses a molding system wherein a die is completely encapsulated during the molding process to encompass and cover the top surface of the die. While Neu contemplates facilitating different sizes and vertical dimensions (col. 5, lines 18-62), it is clear that Neu does not disclose a system for encapsulating an integrated circuit wherein the top surface of the die is left exposed after the encapsulation process. To be clear, the cavity 36, as disclosed in Neu, provides a void around the periphery *as well as over the surface* of the chip 33 during the encapsulation process, as evidenced by Fig. 6 and the accompanying description. While the drawing of the cavity 36 and cavity inserts 29 and 29A in Figs. 3, 4, and 7 are not detailed enough to depict the void above the surface of the chip 33 during the encapsulation process, it is clear that the system disclosed by Neu produces such a void during encapsulation.

The Examiner does not cite the Neu reference to cure the deficiencies of independent claim 1, but rather cites the Neu reference to provide the addition of certain dependent elements. It should be clear that the Neu reference does not disclose “a cavity plate positioned between the first support plate and the second support plate, the cavity plate having an aperture configured to accept only a protruding portion of the circuit package such that the protruding portion of the circuit package contacts the first support plate, and wherein the aperture is sized to create a peripheral void about only the protruding portion of the circuit package to permit a molding compound to be disposed thereabout.” Thus, the Neu reference does nothing to obviate the deficiencies of independent claim 1. Accordingly, the cited combination does not disclose all of the elements recited in claim 1 and therefore, cannot possibly render the claimed subject matter obvious.

Further, even if the recited elements were disclosed in the cited references, there is absolutely no suggestion to combine the references in the manner recited by the present claims. As previously described, the Baerg reference discloses a method and apparatus for removing dielectric material from an integrated circuit package for failure analysis. Conversely, the Neu reference discloses an apparatus for disposing encapsulation molding onto an integrated circuit package. The references clearly teach away from each other since the Baerg reference teaches removing material, while the Neu reference discloses adding material. Teaching away is the antithesis of the art’s suggesting that a person of ordinary skill go in the claimed direction. Essentially, teaching away from the art is a *per se* demonstration of lack of *prima facie* obviousness. *In re Dow Chemical Co.*, 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

Accordingly, the cited references cannot possibly be combined to render the recited claims obvious. Applicant respectfully requests withdrawal of the Examiner's rejection and allowance of claims 2, 8-12, 16 and 20.

The Examiner rejected claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Baerg et al. modified by Neu and further in view of Burns (US 5,654,255). Applicant respectfully traverses this rejection.

Burns does nothing to obviate the deficiencies of the primary reference, unmodified or even modified by the impermissible combination suggested by the Examiner, as discussed above with regard to the base claim. Accordingly, claims 5 and 6 are believed to be allowable both for the subject matter they separately recite as well as by virtue of their dependency from the allowable base claim. Accordingly, Applicant respectfully requests withdrawal of the Examiner's amendment and allowance of claims 5 and 6.

Conclusion

In view of the remarks and amendments set forth above, Applicant respectfully requests allowance of claims 1-14 and 16-20. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Attachment

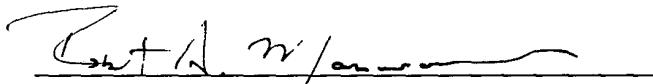
Attached hereto is a clean version of the changes made to the claims by the current amendment. The attached page is captioned "**CLEAN VERSION TO SHOW CHANGES MADE.**"

General Authorization for Extensions of Time

In accordance with 37 C.F.R. § 1.136, Applicant hereby provides a general authorization to treat this and any future reply requiring an extension of time as incorporating a request therefor. Furthermore, Applicant authorizes the Commissioner to charge the appropriate fee for any extension of time to Deposit Account No. 13-3092; Order No.: MICS:0043 (99-0634).

Respectfully submitted,

Date: August 5, 2002



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CLEAN VERSION TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 15 has been cancelled.

Claims 1 and 16 have been amended as follows:

1. (twice amended) A system for molding a circuit package comprising:

a first support plate;

a second support plate proximately positioned with respect to first support plate; and

a cavity plate positioned between the first support plate and the second support plate, the cavity plate having an aperture configured to accept only a protruding portion of the circuit package such that the protruding portion of the circuit package contacts the first support plate, and wherein the aperture is sized to create a peripheral void about only the protruding portion of the circuit package to permit a molding compound to be disposed thereabout.

16. (once amended) The system for molding a circuit package, as set forth in claim 1, wherein the aperture is the same height as the protruding portion of the circuit package.